Bi-Directional Jet Engine System to Support Tail-First Flight and Rapid Inversion of Angle of Attack via Extreme Yaw Induction

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Introduction

Modern fight platforms, whether manned or unmanned, rely upon heat-generation propulsion systems which have rendered RADAR stealth largely useless, particularly when it comes to terminal-phase tracking by a missile system, which is frequently augmented in real-time with telemetry from orbital platforms. Although a novel propulsion system has already been conceptualized by this author which entirely eliminates the problem of heat generation and, therefore, IR signature, this propulsion system is not yet in widespread use.

An entity wishing to continue using tradition jet engines may desire a propulsion solution which, when coupled with other defensive technologies, could allow an unmanned platform to defend itself against incoming missiles.

Abstract

A jet propulsion system which features two engines but three exhaust pipelines could achieve a number of unusual feats which would increase both the efficiency and survivability of the platform. What appears at first glance to be a three-engine system would actually be a two-engine propulsion system with a central nozzle functioning as an air *intake* for tail-first flight and the conventional air intake occluding a covert engine exhaust under the “nose” of the aircraft to support tail-first flight.

Sensitive infrared sensors both installed on the aircraft and on orbital platforms would detect the heat signatures of incoming surface-to-air missiles. As such a missile nears the fighter, a *thrust cross-feed system* (similar to a fuel cross-feed system) would be used to force the exhaust of both engines out either the left or right exhausts exclusively. By forcing the exhaust of both engines out of a single exhaust, an extreme yaw would be induced which would put the tail of the aircraft in the lead. Ordinarily, this would lead to a tail-spin, but if executed with precision and with the right chassis geometry, this controlled spin would be akin to a figure skater rapidly inverting in order to begin skating backward.

Once inversion is complete, the direction of thrust would be inverted and both engines would, in reverse thrust mode, direct thrust through the single forward-facing exhaust hidden within the “air intake.”

At this point, the gun system of the aircraft would be facing toward the incoming missile and could automatically target the incoming missile with its cannon in a manner similar to the Phalanx system. As explained in 19 June 2025, pairs of these aircraft can be used in conjunction with one another to make the targeting of the incoming missiles with on-board guns much more

accurate. A pair of LiDAR systems can be used to measure the exact position of outgoing cannon munitions in three dimensions to determine the precise corrections needed to deliver on-target munitions. In theory, a single test shot followed by a calibrated three-round burst would be sufficient to destroy most incoming missiles.

Additionally, this system would allow for air to be forced into the two primary exhausts in order to greatly enhance the fuel efficiency of the afterburner system. Afterburners tend to use a rich mixture of fuel versus air because it is difficult to inject sufficient air into the afterburner. The shape of the tail section can be leveraged to caused air to be forced in through the central rear air intake which can be injected through a discrete duct into the afterburner.

Conclusion

Therefore, if such fighters were unmanned (so as to enable greater G-forces to be tolerated) and flew exclusively in pairs, these fighters would be capable of defending themselves against SAMs using only carefully targeted cannon munitions. It is a unique *propulsion* system which can make such a defense system possible. Although this is a viable alternative to photo-magnetically propelled craft, I highly recommend the development of the photo-magnetically propelled craft as those craft do not have detectable IR signatures of any sort and are far simply from an engineering standpoint in comparison to this proposed design.